CONTRACT DOCUMENTS AND SPECIFICATIONS

for

High Hanover Parking Facility Maintenance Project 2008
Bid Proposal # 09-09

John P. Bohenko, City Manager

Prepared by:

City of Portsmouth
Engineering Division
Public Works Department

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City of Portsmouth
Portsmouth, NH
Department of Public Works

High/Hanover Parking Facility Maintenance Project

INVITATION TO BID

Sealed bid proposals, **plainly marked, High/Hanover Parking Facility Maintenance Project**, Bid Proposal #09-09 **on the outside of the mailing envelope as well as the sealed bid envelope,** addressed to the Finance/Purchasing Department, City Hall, 1 Junkins Avenue, Portsmouth, New Hampshire, 03801, will be accepted until **October 22, 2008 at 2:30p.m,** at which time all bids will be publicly opened and read aloud.

The work shall consist of removing and replacing control joint sealants and expansion joints in pre-cast floor slabs and sealcoating concrete blocks with miscellaneous drain work.

Completion date will be 30 calendar days from the date of the Notice to Proceed. Liquidated damages shall be assessed at $50.00 per day.

Bidders must determine the quantities of work required and the conditions under which the work will be performed.

Specifications and bid proposal forms may be obtained from the Finance/Purchasing Department on the third floor at the above address, by calling the Purchasing Coordinator at 603-610-7227, or from our website www.cityofportsmouth.com. Questions may be directed to the Purchasing Coordinator.

The City of Portsmouth reserves the right to reject any or all bids, to waive technical or legal deficiencies, to re-bid, and to accept any bid that it may deem to be in the best interest of the City.

Each Bidder shall furnish a bid security in the amount of ten percent (10%) of the bid. The Bid Security may be in the form of a certified check or a bid bond executed by a surety company authorized to do business in the State of New Hampshire, made payable to the City of Portsmouth, N.H.

INSTRUCTIONS TO BIDDERS

BIDDING REQUIREMENTS AND CONDITIONS

1. Special Notice to Bidders

Appended to these instructions is a complete set of bidding and general contract forms. These forms may be detached and executed for the submittal of bids. The plans, specifications, and other documents designated in the proposal form will be considered as part of the proposal, whether attached or not.

The bidders must submit a statement of bidder's qualifications, if requested, subsequent to bid opening but prior to award.

2. Interpretation of Quantities in Bid Schedules

The quantities appearing in the bid schedule are approximate only and are prepared for the comparison of bids. Payment to the contractor will be made only for actual work performed and accepted in accordance with the contract. Any scheduled item of work to be done and materials to be furnished may be increased, decreased or omitted as hereinafter provided, and no claim for loss, anticipated profits or costs incurred in anticipation of work not ultimately performed will be allowed due to such increase or decrease.

3. Examination of Plans, Specifications and Site Work

The bidder is expected to examine carefully the site of the proposed work, the plans, standard specifications, supplemental specifications, special provisions and contract forms before submitting a proposal. The submission of a bid shall be considered conclusive evidence that the bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the contract. It will be conclusive evidence that the bidder has also investigated and is satisfied with the sources of supply for all materials.

Plans, surveys, measurements, dimensions, calculations, estimates and statements as to the condition under which the work is to be performed are believed to be correct, but the contractors must examine for themselves, as no allowance will be made for any errors or inaccuracies that maybe found therein.

4. Familiarity with Laws

The bidder is assumed to have made himself or herself familiar with all federal and state laws and all local by-laws, ordinances and regulations which in any manner affect those engaged or employed on the work or affect the materials or equipment used in the work or affect the conduct of the work, and the bidder, if awarded the contract, shall be obligated to perform the work in conformity with said laws, by-laws, ordinances and regulations notwithstanding its ignorance thereof. If the bidder shall discover any provision in the plans or specifications which is in conflict with any such law, by-law, ordinance or regulation the bidder shall forthwith report it to the engineer in writing.

5. Preparation of Proposal

a) The bidder shall submit its proposal upon the forms furnished by the Owner. The bidder shall specify a lump sum price in figures, for each pay item for which a quantity is given and shall also show the products of the respective prices and quantities written in figures in the column provided for that purpose and the total amount of the proposal obtained by adding the amount of the several items. All words and figures shall be in ink or typed.

If a unit price or a lump sum bid already entered by the bidder on the proposal form is to be altered it should be crossed out with ink, the new unit price or lump sum bid entered above or below it and initialed by the bidder, also with ink.

b) The bidder's proposal must be signed with ink by the individual, by one or more general partners of a partnership, by one or more members or officers of each firm representing a joint venture; by one or more officers of a corporation, by one or more members (if member-managed) or managers (if manager-managed) of a limited liability company, or by an agent of the contractor legally qualified and acceptable to the owner. If the proposal is made by an individual, his or her name and post office address must be shown, by a partnership the name and post office address of each general and limited partner must be shown; as a joint venture, the name and post office address of each venturer must be shown; by a corporation, the name of the corporation and its business address must be shown, together with the name of the state in which it is incorporated, and the names, titles and business addresses of the president, secretary and treasurer.

6. Nonconforming Proposals

Proposals will be considered nonconforming and may be rejected in the Owner's sole discretion for any of the following reasons:

- If the proposal is on a form other than that furnished by the Owner, or if the form is altered or any portion thereof is detached;
- If there are unauthorized additions, conditional or altered bids, or irregularities of any kind which may tend to make the proposal or any portion thereof incomplete, indefinite or ambiguous as to its meaning;
- If the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award; or
- If the proposal does not contain a unit price for each pay item listed except in the case of authorized alter pay items.

7. Proposal Guaranty

No proposal will be considered unless accompanied by a bid bond, surety, or similar guaranty of the types and in an amount not less than the amount indicated in the Invitation to Bid. All sureties shall be made payable to the "City of Portsmouth". If a bid bond is used by the bidder it shall be:

- In a form satisfactory to the Owner;
- With a surety company licensed, authorized to do business in, and subject to the jurisdiction of the courts of the State of New Hampshire; and
- Conditioned upon the faithful performance by the principal of the agreements contained in the sub-bid or the general bid.

In the event any irregularities are contained in the proposal guaranty, the bidder will have four business days (not counting the day of opening) to correct any irregularities. The corrected guaranty must be received by 4:00 p.m. If irregularities are not corrected to the satisfaction of the Owner, the Owner, in its sole discretion, may rejected the bid.

8. Delivery of Proposals

When sent by mail, the sealed proposal shall be addressed to the Owner at the address and in the care of the official in whose office the bids are to be received. All proposals shall be filed prior to the time and at the place specified in the invitation for bids. Proposals received after the time for opening of the bids will be returned to the bidder, unopened.

9. Withdrawal of Proposals

A bidder will be permitted to withdraw his or her proposal unopened after it has been submitted if the Owner receives a request for withdrawal in writing prior to the time specified for opening the proposals.

10. Public Opening of Proposals

Proposals will be opened and read publicly at the time and place indicated in the invitation for bids. Bidders, their authorized agents, and other interested parties are invited to be present.

11. Disqualification of Bidders

Any or all of the following reasons may be deemed by Owner in its sole discretion as being sufficient for the disqualification of a bidder and the rejection of his proposal:

- More than one proposal for the same work from an individual, firm, or corporation under the same or different name;
- Evidence of collusion among bidders;
- Failure to submit all required information requested in the bid specifications;
- **Contractor lacks a successful track record of five years or more in the field of concrete repair and protection;**
- Lack of competency or of adequate machinery, plant or other equipment, as revealed by the statement of bidders qualification or otherwise;
- Uncompleted work which, in the judgment of the owner, might hinder or prevent the prompt completion of additional work if awarded;
- Failure to pay, or satisfactorily settle, all bills due for labor and materials on former contracts;
- Default or unsatisfactory performance on previous contracts; or
- Such disqualification would be in the best interests of the Owner.

12. Material Guaranty and Samples

Before any contract is awarded, the bidder may be required to furnish a complete statement of the origin, composition and manufacture of any or all materials to be used in the construction of the work, and the Owner may, in its sole discretion, reject the bid based on the contents of the statement or as a result of the failure of the bidder to submit the statement.

AWARD AND EXECUTION OF CONTRACT

1. Consideration of Proposals

After the proposals are opened and read, they will be compared on the basis of the total price for all sections of work and any such additional considerations as may be identified in the bid documents. The results of such comparisons will be immediately available to the public. In case of a discrepancy between the prices written in words and those written figures, the prices written in words shall govern. In case of a discrepancy between the total shown in the proposal and that obtained by adding the products of the quantities of items and unit bid prices, the latter shall govern.

2. Award of Contract

Within 30 calendar days after the opening of proposals, if a contract is to be awarded, the award will be made to the lowest responsible and qualified bidder whose proposal complies with all the requirements prescribed. The successful bidder will be notified, in writing, mailed to the address on his or her proposal, that his or her bid has been accepted and that the bidder has been awarded the contract.

3. Reservation of Rights

The Owner reserves the right to reject any or all proposals, to waive technicalities or to advertise for new proposals, if, in the sole discretion of the Owner, the best interest of the City of Portsmouth will be promoted thereby. The Owner further reserves the right to modify the scope of work in the event that bids exceed budgeted amounts.

The Owner reserves the right to cancel the award of any contract at any time before the execution of such contract by all parties without any liability of the Owner.

Without limiting the foregoing, award of this contract is contingent upon Owner obtaining prior to award all approvals necessary from impacted property owners.

4. Return of Proposal Guaranty

All proposal guaranties, except those of the three lowest bidders, will be returned upon request following the opening and checking of the proposals. The proposal guaranties of the three lowest bidders will be returned within ten days following the award of the contract if requested.

5. Contract Bonds

At the time of the execution of the contract, the successful bidder shall furnish:

- Labor and materials payment bond in the sum equal to 100 percent of the contract amount.

At the time of project completion, the Owner may, in its sole discretion, permit the Contractor to substitute a maintenance bond in lieu of holding retainage for the entire guaranty period. If a bond is furnished it shall meet the following criteria:

- The bond shall be in an amount equal to 20 percent of the contract amount. Such bond shall guarantee the repair of all damage due to faulty materials or workmanship provided or done by the contractor. The guarantee shall remain in effect for a period of one year after the date of final acceptance of the job by the Owner.

Each bond shall be: (1) in a form satisfactory to the Owner; (2) with a surety company licensed and authorized to do business and with a resident agent designated for services of process in the State of New Hampshire; and (3) conditioned upon the faithful performance by the principal of the agreements contained in the original bid. All premiums for the contract bonds are to be paid by the contractor.

6. Execution and Approval of Contract

The successful bidder is required to present all contract bonds, to provide proof of insurance, and to execute the contract within 10 days following receipt of the City's notification of acceptance of the bid. No contract shall be considered as in effect until it has been fully executed by all parties.

7. Failure to Execute Contract

Failure to execute the contract and file acceptable bonds within 10 days after notification of acceptance of bid shall be just cause for the cancellation of the award and the forfeiture of the proposal guarantee which shall become the property of the Owner, not as a penalty, but in liquidation of damages sustained. Award may then be made to the next lowest responsible bidder, or the City may exercise its reserved rights including the rejection of all bids or re-advertisement.

PROPOSAL FORM

HIGH/HANOVER PARKING FACILITY MAINTENANCE PROJECT

CITY OF PORTSMOUTH, N.H.

To the City of Portsmouth, New Hampshire, herein called the Owner.

The undersigned, as Bidder, herein referred to as singular and masculine declares as follows:

1. All interested in the Bid as Principals are named herein.

2. This bid is not made jointly, or in conjunction, cooperation or collusion with any other person, firm, corporation, or other legal entity;

3. No officer, agent or employee of the Owner is directly or indirectly interested in this Bid.

4. The bidder has carefully examined the sites of the proposed work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this Bid, and the bidder has carefully read and examined the Drawings, Agreement, Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof;

5. The bidder understands that the quantities of work calculated in the Bid or indicated on the Drawings or in the Specifications or other Contract Documents are approximate and are subject to increase or decrease or deletion as deemed necessary by the Portsmouth City Engineer. Any such changes will not result in or be justification for any penalty or increase in contract prices; and agrees that, if the Bid is accepted the bidder will contract with the Owner, as provided in the Contract Documents, this Bid Form being part of said Contract Documents, and that the bidder will supply or perform all labor, services, plant, machinery, apparatus, appliances, tools, supplies and all other activities required by the Contract Documents in the manner and within the time therein set forth, and that the bidder will take in full payment therefor the following item prices, to wit:

PROPOSAL FORM (continued)

THIS PROJECT SHALL BE BID BY UNIT PRICES:

ITEM #	ESTIMATED QUANTITY	ITEM DESCIPTION & UNIT PRICE IN WORDS	UNIT PRICE IN FIGURES	ITEM TOTAL IN FIGURES
1.	1	Project Mobilization (Not to exceed 15% of Total Project Cost) Per Lump Sum	$_____	$_____
2.	9,200 LF	Remove and Replace Sealant at Pre-cast Joints including Cant Beads at Stairtowers and Block Walls Per Linear Foot	$_____	$_____
3.	63 LF	Remove and Replace Expansion Joints at Pre-cast Joints Per Linear Foot	$_____	$_____
4.	2,500 SF	Prep, Prime & Paint Per SF	$_____	$_____

Add/Alternate #1

5.	10,400 SF	Corrosion Inhibitor Treatment Per Square Foot	$_____	$_____

PROPOSAL FORM (continued)

Award of Bid will be based on the Total Bid of Items 1 through 4 complied by the Bidder using the estimated quantities listed above

In Figures $_____

In Words $_____

To Bidder: It is the intention of this contract that the items listed above describe completely and thoroughly the entirety of the work as shown on the plans and as described in the specifications. All other items required to accomplish the above items are considered to be subsidiary work, unless shown as a pay item.

The undersigned agrees that for extra work, if any, performed in accordance with the terms and provisions of the Contract Documents, the bidder will accept compensation as stipulated therein.

_____
Date

_____
Company

By:_____
Signature

_____
Business Address

Title:_____

_____
City, State, Zip Code

Telephone:_____

The Bidder has received and acknowledged Addenda No._____through _____.
All Bids are to be submitted on this form and in a sealed envelope, plainly marked on the outside with the Bidder's name and address and the Project name as it appears at the top of the Proposal Form.

BID SECURITY BOND

(This format provided for convenience, actual Bid Bond is acceptable in lieu of, if compatible.)

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned

_____, as Principal, and

_____, as Surety, are hereby

held and firmly bound unto _____

IN THE SUM OF _____

as liquidated damages for payment of which, well and truly to be made we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of this obligation is such that whereas the Principal has submitted to the

_____ _____

A CERTAIN Bid attached hereto and hereby made a part hereof to enter into a contract in writing, hereinafter referred to as the "AGREEMENT" and or "CONTRACT", for

_____

_____

_____

NOW THEREFORE,

(a) If said Bid shall be rejected or withdrawn as provided in the INFORMATION FOR BIDDERS attached hereto or, in the alternative,

(b) If said Bid shall be accepted and the Principal shall duly execute and deliver the form of AGREEMENT attached hereto and shall furnish the specified bonds for the faithful performance of the AGREEMENT and/or CONTRACT and for the payment for labor and materials furnished for the performance of the AGREEMENT and or CONTRACT,

then this obligation shall be void , otherwise it shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder in no event shall exceed the amount of this obligation.

BID SECURITY BOND (continued)

The Surety, for value received, hereby agrees that the obligation of said surety and its bond shall be in no way impaired or affected by any extensions of the time within such BID may be accepted, and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the parties hereto have duly executed

this bond on the _____ day of _____, 20__.

_____L.S.
(Name of Principal)

(SEAL)

BY _____

_____
(Name of Surety)

BY _____

STATEMENT OF BIDDER'S QUALIFICATIONS

Supply with Bid

All questions must be answered and the data given must be clear and comprehensive. Add separate sheets if necessary

1. Name of Bidder

2. Permanent Main Office Address

3. Form of Entity

4. When Organized

5. Where Organized

6. How many years have you been engaged in the contracting business under your present name; also state names and dates of previous firm names, if any.

7. Contracts on hand; (schedule these, showing gross amount of each contract and the approximate anticipated dates of completion).

8. General character of work performed by your company.

9. Have you failed within the last seven years to complete any work awarded to you? _____(no)____(yes). If so, where and why?

10. Have you defaulted on a contract within the last seven years?
_____(no)_____(yes). If so, where and why?

11. Have you ever failed to complete a project in the time allotment according to the Contract Documents?
_____(no)_____(yes). If so, where and why?

12. List the most important contracts recently executed by your company, stating approximate cost for each, and the month and year completed.

13. List your major equipment available for this contract.

14. List your key personnel such as project superintendent and foremen available for this contract.

STATEMENT OF BIDDERS QUALIFICATIONS (continued)

15. List any subcontractors whom you would expect to use for the following (unless this work is to be done by your own organization).
    a. Expansion Joint Work _____
    b. Control Joint Work _____
    c. Corrosion Inhibitor Work _____

Latest Financial Statements: The City reserves the right to request Bidders' latest Financial Statements. Certified audited statements if available, prepared by an independent certified public accountant, may be requested by Owner. If requested, such statements must be provided within five (5) business days or the bid proposal will be rejected. Certified Audited Statement are preferred. Internal statements may be used only if independent statements were not prepared.

Dated at _____ this _____ day of _____, 20___.

_____
Name of Bidder

BY_____

TITLE_____

State of_____

County of_____

_____being duly sworn, deposes and

says that the bidder is _____of_____
(Name of Organization)

and answers to the foregoing questions and all statements contained therein are true and correct.

Sworn to before me this ____day of _____, 20__.

_____
Notary of Public

My Commission expires_____

CONTRACT AGREEMENT

HIGH/HANOVER PARKING FACILITY MAINTENANCE PROJECT 2008

THIS AGREEMENT made as of the **Xth** day of **XXXXXXX** in the year **2008,** by and between the City of Portsmouth, New Hampshire (hereinafter call the Owner) and XXXXXXXX (hereinafter called the Contractor),

WITNESSETH; that the Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE I- Work - The Contractor shall perform all work as specified or indicated in the Contract Documents for the completion of the Project. The Contractor shall provide, at his expense, all labor, materials, equipment and incidentals as may be necessary for the expeditious and proper execution of the Project.

ARTICLE II - ENGINEER - The City Engineer shall mean the Director of Public Works, or his authorized representative will act as engineer in connection with completion of the Project in accordance with the Contract Documents.

ARTICLE III - CONTRACT TIME - The work will commence and finish in accordance with the Notice to Proceed.

ARTICLE IV - CONTRACT PRICE and PAYMENT- Upon final acceptance of the work and settlement of all claims, Owner shall pay the Contractor the Contract Price as shown in the Bid Proposal, subject to additions and deductions (such as retainage) provided for in the Contract Documents.

ARTICLE V - RETAINAGE – To insure the proper performance of this Contract, the Owner shall retain ten percent of the Contract Price as specified in the Contract Documents.

ARTICLE VI - LIQUIDATED DAMAGES - In event the Contractor fails to successfully complete the work within the specified contract time the Owner shall assess the Contractor liquidated damages in the amount of **fifty dollars ($50.00)** for each calendar day beyond the specified completion date. Liquidated damages shall be deducted from the Contract Price prior to final payment of the Contractor.

CONTRACT AGREEMENT (continued)

ARTICLE VII – CONTRACT DOCUMENTS – The Contract Documents which comprise the contract between Owner and Contractor are attached hereto and made a part hereof and consist of the following:

8.1 This Agreement
8.2 Contractor's Bid and Bonds
8.3 Notice of Award, Notice to Proceed
8.4 Instruction to Bidders
8.5 General Requirements, Control of Work, Temporary Facilities, Measurement and Payment, Standard Specifications
8.6 Insurance Requirements
8.7 Standard and Technical Specifications
8.8 Drawings
8.9 Special Provisions
8.10 Any modifications, including change orders, duly delivered after execution of this Agreement.

ARTICLE VIII – TERMINATION FOR DEFAULT – Should contractor at any time refuse, neglect, or otherwise fail to supply a sufficient number or amount of properly skilled workers, materials, or equipment, or fail in any respect to prosecute the work with promptness and diligence, or fail to perform any of its obligations set forth in the Contract, Owner may, at its election, terminate the employment of Contractor, giving notice to Contractor in writing of such election, and enter on the premises and take possession, for the purpose of completing the work included under this Agreement, of all the materials, tools and appliances belonging to Contractor, and to employ any other persons to finish the work and to provide the materials therefore at the expense of the Contractor.

ARTICLE IX – INDEMNIFICATION OF OWNER – Contractor will indemnify Owner against all suits, claims, judgments, awards, loss, cost or expense (including without limitation attorneys' fees) arising in any way out of the Contractor's negligent performance of its obligations under this Contract. Contractor will defend all such actions with counsel satisfactory to Owner at its own expense, including attorneys' fees, and will satisfy any judgment rendered against Owner in such action.

ARTICLE X – PERMITS – The Contractor will secure at its own expense, all permits and consents required by law as necessary to perform the work and will give all notices and pay all fees and otherwise comply with all applicable City, State, and Federal laws, ordinances, rules and regulations.

ARTICLE XI – INSURANCE – The Contractor shall secure and maintain, until acceptance of the work, insurance with limits not less than those specified in the Contract.

ARTICLE XII – MISCELLANEOUS –

A. Neither Owner nor Contractor shall, without the prior written consent of the other, assign, sublet or delegate, in whole or in part, any of its rights or obligations under any of the Contract Documents; and, specifically not assign any monies due, or to become due, without the prior written consent of Owner.

B. Owner and Contractor each binds himself, his partners, successors, assigns and legal representatives, to the other party hereto in respect to all covenants, agreements and obligations contained in the Contract Documents.

C. The Contract Documents constitute the entire Agreement between Owner and Contractor and may only be altered amended or repealed by a duly executed written instrument.

D. The laws of the State of New Hampshire shall govern this Contract without reference to the conflict of law principles thereof.

E. Venue for any dispute shall be the Rockingham County Superior Court unless the parties otherwise agree.

IN WITNESS WHEREOF, the parties hereunto executed this

AGREEMENT the day and year first above written.

BIDDER:

BY:_____

TITLE:_____

CITY OF PORTSMOUTH, N.H.

BY:_____
John P. Bohenko

TITLE: City Manager

NOTICE OF INTENT TO AWARD

Date:

TO:

IN AS MUCH as you were the low responsible bidder for work entitled:

HIGH/HANOVER PARKING FACILITY MAINTENANCE PROJECT

You are hereby notified that the City intends to award the above referenced project to you.

Immediately take the necessary steps to execute the Contract and to provide required bonds and proof of insurance within ten (10) calendar days from the date of this Notice.

The City reserves the right to revoke this Notice if you fail to take the necessary steps to execute this Contract.

City of Portsmouth
Portsmouth, New Hampshire

Judie Belanger,
Finance Director

NOTICE TO PROCEED

DATE:

HIGH/HANOVER PARKING FACILITY MAINTENANCE PROJECT

TO:

YOU ARE HEREBY NOTIFIED TO COMMENCE WORK IN ACCORDANCE

WITH THE AGREEMENT DATED XXXXXX, 2008 WITHIN THIRTY (30) DAYS FROM THE NOTICE TO PROCEED.

CITY OF PORTSMOUTH, N.H.

_____
BY: Steven F. Parkinson, PE

TITLE: Public Works Director

ACCEPTANCE OF NOTICE

RECEIPT OF THE ABOVE NOTICE TO
PROCEED IS HEREBY ACKNOWLEDGED BY

_____

This the _____day of_____ 20__

By:_____

Title:_____

CHANGE ORDER

Change Order Number Date of Issuance:

Owner: CITY OF PORTSMOUTH, N.H

Contractor:

You are directed to make the following changes in the Contract Documents:

Purpose of Change Order: Additional Work

Attachments: Spreadsheet

CHANGE IN CONTRACT PRICE	CHANGE IN CONTRACT TIME
Original Contract Price: $	Original Completion Date:
Contract Price prior to this Change Order: $	Contract Time prior to this Change Order: days
Net Increase of this Change Order: $	Net Increase of this Change Order: days
Contract Price with all approved Change Orders: $	Contract Time with all approved Change Orders: days

RECOMMENDED:	APPROVED:		APPROVED:
by_____	by_____	by_____	by_____
PW Director	City Finance	City Manager	Contractor

LABOR AND MATERIAL PAYMENT BOND

(This format provided for convenience, actual Labor and Material Bond is acceptable in lieu, if compatible)

Bond Number _____

KNOW ALL MEN BY THESE PRESENTS:

that _____

as Principal, hereinafter called Contractor, and _____ (Surety Company) a corporation organized and existing under the laws of the State of

_____ and authorized to do business in the State of New Hampshire hereinafter called Surety, are held and firmly bound unto the City of Portsmouth, N.H. Obligee, hereinafter called Owner, for the use and benefit of claimants as herein below defined, in the

amount of _____ Dollars ($_____), for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____ entered into a

contract with Owner for _____ in accordance with drawings and specifications prepared by the Public Works Department, 680 Peverly Hill Road, Portsmouth, N.H. 03801, which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that the Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract and for the hire of all equipment, tools, and all other things contracted for or used in connection therewith, then this obligation shall be void, otherwise it shall remain in full force and effect, subject however, to the following conditions:

(1) A claimant is defined as one having a direct contract with the Principal or, with a subcontractor of the Principal for labor, material, equipment, or other things used or reasonably required for use in the performance of the Contract. "Labor and material" shall include but not be limited to that part of water, gas, power, light, heat, oil and gasoline, telephone service or rental of equipment applicable to the Contract.

(2) The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such a claimant, may sue on this bond for the use of such claimant, prosecute the suit by final judgment for such sum or sums as may be

LABOR AND MATERIAL PAYMENT BOND (continued)

justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any such suit or any costs or expenses of any such suit, and principal and surety shall jointly and severally indemnify, defend and hold the Owner harmless for any such suit, costs or expenses.

(3) No suit or action shall be commenced hereunder by any claimant:

(a) Unless Claimant, other than one having a direct contract with the Principal, shall have given notice to all the following:

The Principal, the Owner and the Surety above named, within six (6) calendar months after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner, and Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the State of New Hampshire save that such service need not be made by a public officer.

(b) After the expiration of one (1) year following the date on which Principal ceased all work on said contract, it being understood , however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

(c) Other than in a State court of competent jurisdiction in and for the county or other political subdivision of the State in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere. (4) The amount of this bond may be reduced by and to the extent of any payment of payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed on record against said improvement, whether or not claim for the amount of such lien by presented under and against this bond.

Signed and sealed this _____ day of _____, 20____. In the presence of:

_____ BY: _____
(Witness) (Principal) (Seal)

_____
(Surety Company)

_____ BY: _____
(Witness) (Title) (Seal)

LABOR AND MATERIAL PAYMENT BOND (continued)

Note:
If the Principal (Contractor) is a partnership, the Bond should be signed by each of the partners.

If the Principal (Contractor) is a corporation, the Bond should be signed in its correct corporate name by its duly authorized Officer or Officers.

If this bond is signed on behalf of the Surety by an attorney-in-fact, there should be attached to it a duly certified copy of his Power of Attorney showing his authority to sign such Bonds.

There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts of the Agreement.

MAINTENANCE BOND

At the Owner's election, a maintenance bond may be substituted for retainage at the completion of the project. If the Owner permits a maintenance bond, it shall be in the amount of **Twenty Percent (20%)** of the contract price with a corporate surety approved by the Owner. Such bond shall be provided at the time of Contract completion and shall guarantee the repair of all damage due to faulty materials or workmanship provided or done by the Contractor. This guarantee shall remain in effect for a period of one year after the date of final acceptance of the job by the Owner.

CONTRACTOR'S AFFIDAVIT

STATE OF _____:

COUNTY OF _____:

Before me, the undersigned, a _____
(Notary Public, Justice of the Peace)

in and for said County and State personally appeared, _____
(Individual, Partner, or duly authorized representative of Corporate)

who, being duly sworn, according to law deposes and says that the cost of labor, material, and equipment and outstanding claims and indebtedness of whatever nature arising out of the performance of the Contract between

CITY OF PORTSMOUTH, NEW HAMPSHIRE

and _____
(Contractor)

of _____

Dated: _____

has been paid in full for Construction of: **High/Hanover Parking Facility Maintenance Project**

_____

(Individual, Partner, or
duly authorized
representative of
Corporate Contractor)

Sworn to and subscribed
before me this _____day
of _____ 20____

_____

CONTRACTOR'S RELEASE

KNOW ALL MEN BY THESE PRESENTS that _____

(Contractor) of _____, County of _____and State of

_____ does hereby acknowledge

that_____(Contractor)

has on this day had, and received from the CITY OF PORTSMOUTH NEW HAMPSHIRE, final and completed

payment for the Construction of:

High/Hanover Parking Facility Maintenance Project

NOW THEREFORE, the said _____

(Contractor)

for myself, my heirs, executors, and administrators) (for itself, its successors and assigns) do/does by these presents remise, release, quit-claim and forever discharge the City of Portsmouth, New Hampshire, its successors and assigns, of and from all claims and demands arising from or in connection with the said Contract dated _____, and of and from all, and all manners of action and actions, cause and causes of action and actions, suits, debts, dues, duties, sum and sums of money, accounts, reckonings, bonds, bills, specifications, covenants, contracts, agreements, promises, variances, damages, judgments, extents, executions, claims and demand, whatsoever in law of equity, or otherwise, against the City of Portsmouth, New Hampshire, its successors and assigns, which (I, my heirs, executors, or administrators) (it, its successors and assigns) ever had, now have or which (I, my heirs, executors, or administrators) (it, its successors and assigns) hereafter can shall or may have, for, upon or by reason of any matter, cause, or thing whatsoever; from the beginning of record time to the date of these presents.

IN WITNESS WHEREOF,

Contractor:

_____ By:_____

print name of witness:_____ Its Duly Authorized _____

Dated: _____

GENERAL REQUIREMENTS

SCOPE OF WORK

1. INTENT OF CONTRACT

The intent of the Contract is to provide for the construction and completion in every detail of the work described. The Contractor shall furnish all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the terms of the Contract. The Contractor shall be required to conform to the intent of the plans and specifications. No extra claims shall be allowed for portions of the work not specifically addressed in the plans and specifications but required to produce a whole and complete project, such work will be considered subsidiary to the bid items.

2. INCIDENTAL WORK

Incidental work items for which separate payment is not measured includes, but is not limited to, the following items:

a. Clearing, grubbing and stripping (unless otherwise paid for)
b. Clean up
c. Plugging existing sewers and manholes
d. Signs
e. Mobilization/Demobilization (unless otherwise paid for)
f. Restoration of property
g. Cooperation with other contractors, abutters and utilities.
h. Utility crossings, (unless otherwise paid for)
i. Minor items - such as replacement of fences, guardrails, rock wall, etc.
j. Steel and/or wood sheeting as required.
k. Accessories and fasteners or components required to make items paid for under unit prices or lump sum items complete and functional.

3. ALTERATION OF PLANS OR OF CHARACTER OF WORK

The Owner reserves the right, without notice to Surety, to make such alterations of the plans or of the character of the work as may be necessary or desirable to complete fully and acceptably the proposed construction; provided that such alterations do not increase or decrease the contract cost. Within these cost limits, the alterations authorized in writing by the Owner shall not impair or affect any provisions of the Contract or bond and such increases or decreases of the quantities as a result from these alterations or deletions of certain items, shall not be the basis of claim for loss or for anticipated profits by the contractor. The contractor shall perform the work as altered at the contract unit price or prices.

4. EXTRA WORK ITEMS

Extra work shall be performed by the Contractor in accordance with the specifications and as directed, and will be paid for at a price as provided in the Contract documents or if such pay items are not applicable than at a price negotiated between the contractor and the Owner or at the unit bid price. If the Owner determines that extra work is to be performed, a change order will be issued.

5. CHANGE ORDERS

The Owner reserves the right to issue a formal change order for any increase, decrease, deletion, or addition of work or any increase in contract time or price. The contractor shall be required to sign the change order and it shall be considered as part of the Contract documents.

6. FINAL CLEANING UP

Before acceptance of the work, the contractor shall remove from the site all machinery, equipment, surplus materials, rubbish, temporary buildings, barricades and signs. All parts of the work shall be left in a neat and presentable condition. On all areas used or occupied by the contractor, regardless of the contract limits, the bidder shall clean-up all sites and storage grounds.

The items prescribed herein will not be paid for separately, but shall be paid for as part of the total contract price.

7. ERRORS AND INCONSISTENCY IN CONTRACT DOCUMENTS

Any provisions in any of the Contract Documents that may be in conflict with the paragraphs in these General Requirements shall be subject to the following order of precedence for interpretation.

1. Technical Specifications and Special Provisions will govern General Requirements.

CONTROL OF WORK

1. AUTHORITY OF ENGINEER

(a) All work shall be done under supervision of the City Engineer and to his satisfaction. The City Engineer will decide all questions which may arise as to the quality and acceptability of materials furnished and work performed and as to the rate of progress of the work; all questions that may arise as to the interpretation of the plans and specifications; and all questions as to the acceptable fulfillment of the Contract by the Contractor.

(b) The City Engineer will have the authority to suspend the work wholly or in part for such periods as he may deem necessary due to the failure of the Contractor to correct conditions unsafe for workers or the general public; for failure to carry out provisions of the Contract; for failure to carry out orders; for conditions considered unsuitable for the prosecution of the work, including unfit weather; or for any other condition or reason deemed to be in the public interest. The Contractor shall not be entitled any additional payments arising out of any such suspensions.

(c) The Owner reserves the right to demand a certificate of compliance for a material or product used on the project. When the certificate of compliance is determined to be unacceptable to the City Engineer the Contractor may be required to provide engineering and testing services to guarantee that the material or product is suitable for use in the project, at its expense (see Sample of Certificate of Compliance).

2. PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPES

(a) The Contractor shall use every precaution to prevent injury or damage to wires, poles, or other property of public utilities; trees, shrubbery, crops, and fences along and adjacent to the right-of-way, all underground structures such as pipes and conduits, within or outside of the right-of-way; and the Contractor shall protect and carefully preserve all property marks until an authorized agent has witnessed or otherwise referenced their location.

(b) The Contractor shall be responsible for all damage or injury to property of any character, during the prosecution of the work, resulting from any act, omission, neglect, or misconduct in his manner or method of executing the work, or at any time due to defective work or materials, and said responsibility will not be released until the project shall have been completed and accepted.

(c) When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or as a result of the failure to perform work by the Contractor, the Contractor shall restore, at its own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing rebuilding, or otherwise restoring as may be directed, or the Contractor shall make good such damage or injury in an acceptable manner.

(d) The Contractor shall paint with tree paint all scars made on fruit or ornamental trees by equipment, construction operations, or the removal of limbs larger than one inch in diameter. Damaged trees must be replaced if so determined by the City Arborist, in his or her sole discretion.

(e) If the Contractor fails to repair, rebuild or otherwise restore such property as may be deemed necessary, the Owner, after 48 hours notice, may proceed to do so, and the cost thereof may be deducted from any money due or which may become due the Contractor under the contract.

(f) It is the intent of the Parties that the Contractor preserve, to as great an extent as possible, the natural features of the site.

CONTROL OF WORK (continued)

3. MAINTENANCE DURING CONSTRUCTION

The Contractor shall maintain the work during construction and until the project is accepted. This maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and workers to ensure that the structure is kept in satisfactory conditions at all times.

4. SAFETY PRECAUTIONS

Upon commencement of work, the Contractor shall be responsible for initiating, maintaining and supervising all safety precautions necessary to ensure the safety of employees on the site, other persons who may be affected thereby, including the public, and other property at the site or adjacent thereto.

5. PERMITS

It will be the responsibility of the Contractor to obtain all permits required for the operation of equipment in, or on, all city streets and public ways.

6. BARRICADES, WARNING SIGNS AND TRAFFIC OFFICERS

(a) The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient lights, danger signals, signs and other traffic control devices, and shall take all necessary precautions for the protection of the work and safety of the public. Roadway closed to traffic shall be protected by effective barricades. Obstructions shall be illuminated during hours of darkness. Suitable warning signs shall be provided to control and direct traffic in a proper manner, as approved by the engineer.

(b) The Contractor will be held responsible for all damage to the work from traffic, pedestrians, animals or any other cause due to lack of adequate controlling devices.

(c) The Contractor shall provide such police officers as the City Engineer deems necessary for the direction and control of traffic within the site of project.

The work prescribed herein will not be paid for separately but will be paid for as part of the Contract Price unless specifically appearing as a bid item.

INSURANCE REQUIREMENTS

Insurance shall be in such form as will protect the Contractor from all claims and liabilities for damages for bodily injury, including accidental death, and for property damage, which may arise from operations under this contract whether such operation by himself or by anyone directly or indirectly employed by him.

AMOUNT OF INSURANCE

A) Comprehensive General Liability:
Bodily injury or Property Damage - $2,000,000
Per occurrence and general aggregate

B) Automobile and Truck Liability:
Bodily Injury or Property Damage - $2,000,000
Per occurrence and general aggregate

Coverage requirements can be met with excess policies

Additionally, the Contractor shall purchase and maintain the following types of insurance:

A) Full Workers Comprehensive Insurance coverage for all people employed by the Contractor to perform work on this project. This insurance shall at a minimum meet the requirements of the most current laws of the State of New Hampshire.

B) Contractual Liability Insurance coverage in the amounts specified above under Comprehensive General Liability.

C) Product and Completed Operations coverage to be included in the amounts specified above under Comprehensive General Liability.

ADDITIONAL INSURED

All liability policies (including any excess policies used to meet coverage requirements) shall include the City of Portsmouth, New Hampshire as named Additional Insureds.

1) The contractor's insurance shall be primary in the event of a loss.
2) City of Portsmouth shall be listed as a Certificate Holder. The City shall be identified as follows:

City of Portsmouth
Attn: Legal Department
1 Junkins Avenue
Portsmouth, NH 03801

MEASUREMENT AND PAYMENT

1. MEASUREMENT OF QUANTITIES

(a) All work completed under the contract will be measured according to the United States standard measure.

(b) The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the contract will be those methods generally recognized as conforming to good engineering practice. Unless otherwise stated all quantities measured for payment shall be computed or adjusted for "in place" conditions.

(c) Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures having an area of 9 square feet or less. Unless otherwise specified, transverse measurements for area computations will be the dimensions shown on the plans or ordered in writing.

(d) Structures will be measured according to lines shown on the plans or as ordered unless otherwise provided for elsewhere in the specifications.

(e) In computing volumes of excavation, embankment, and borrow, the average end area method will be used. Where it is impracticable to measure by the cross-section method, acceptable methods involving three-dimensional measurement may be used. When measurement of borrow in vehicles is permitted, the quantity will be determined as 80 percent of the loose volume.

(f) In computing volumes of concrete, stone and masonry, the prismoidal method will be used. The term "ton" will mean the short ton consisting of 2,000 pounds avoirdupois.

(g) Except as specified below, all materials that are measured or proportioned by weight shall be weighed on scales which the Contractor has had sealed by the State or by a repairman registered by the Commissioner of Agriculture. All weighing shall be performed in a manner prescribed under the Rules and Regulations of the Bureau of Weights and Measures of the New Hampshire Department of Agriculture.

(h) Weighing of materials on scales located outside New Hampshire will be permitted for materials produced or stored outside the state, when requested by the Contractor and approved. Out-of-state weighing in order to be approved, must be performed by a licensed public weigh master or a person of equal authority in the state concerned on scales accepted in the concerned state.

(i) Each truck used to haul material being paid for by weight shall bear a plainly legible identification mark, and if required, shall be weighed empty daily at such times as directed.

(j) When material is weighed, the individual weight slips, which shall be furnished by the Contractor, for trucks, trailers, or distributors, shall show the following information: the date; the project; the material or commodity; the dealer or vendor; the Contractor or Subcontractor; the location of the scales; the vehicle registration number or other approved legible identification mark; the tare and net weights, with gross weights when applicable; and the weigher's signature or his signed initials.

MEASUREMENT AND PAYMENT (continued)

(k) The right is reserved to weight any truck, trailer, or distributor, at locations designated, before and after making deliveries to the project.

(l) Bituminous materials will be measured by the gallon or ton.

(m) When material is specified to be measured by the cubic yard but measurement by weight is approved, such material may be weighed and the weight converted to cubic yards for payment purposes. Necessary conversion factors will be determined by the Owner.

(n) The term "lump sum" when used as an item of payment will mean complete payment for the work described in the item.

(o) When a complete structure or structural unit (in effect, "lump sum" work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories, so as to provide the item complete and functional. Except as may be otherwise provided, partial payments for lump sum items will be made approximately in proportion to the amount of the work completed on those items.

(p) Material wasted without authority will not be included in the final estimate.

2. SCOPE OF PAYMENT

(a) The Contractor shall receive and accept compensation provided for in the contract as full payment for furnishing all materials and for performing all work under the contract in a complete and acceptable manner and for all risk, loss, damage or expense of whatever character arising out of the nature of the work or the prosecution thereof.

(b) The Contractor shall be liable to the Owner for failure to repair, correct, renew or replace, at his own expense, all damage due or attributable to defects or imperfections in the construction which defects or imperfections may be discovered before or at the time of the final inspection and acceptance of the work.

(c) No monies, payable under the contract or any part thereof, except the first estimate, shall become due or payable if the Owner so elects, until the Contractor shall satisfy the Owner that the Contractor has fully settled or paid all labor performed or furnished for all equipment hired, including trucks, for all materials used, and for fuels, lubricants, power tools, hardware and supplies purchased by the Contractor and used in carrying out said contract and for labor and parts furnished upon the order of said Contractor for the repair of equipment used in carrying out said contract; and the Owner, if he so elects, may pay any and all such bills, in whole or in part, and deduct the amount of amounts so paid from any partial or final estimate, excepting the first estimate.

MEASUREMENT AND PAYMENT (continued)

3. COMPENSATION FOR ALTERED QUANTITIES

(a) Except as provided for under the particular contract item, when the accepted quantities of work vary from the quantities in the bid schedule the Contractor shall accept as payment in full, so far as contract items are concerned, at the original contract unit prices for the accepted quantities of work done. No allowance will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly from such alterations or indirectly from unbalanced allocation among the contract items of overhead expense on the part of the Bidder and subsequent loss of expected reimbursements therefore or from any other cause.

(b) Extra work performed will be paid for at the contract bid prices or at the price negotiated between the Owner and the Contractor if the item was not bid upon. If no agreement can be negotiated, the Contractor will accept as payment for extra work, cost plus 15% (overhead and profit). Costs shall be substantiated by invoices and certified payroll.

4. PARTIAL PAYMENTS
NOT APPLICABLE

5. FINAL ACCEPTANCE

Upon due notice from the Contractor of presumptive completion of the entire project, the City Engineer will make an inspection. If all construction provided for and contemplated by the contract is found complete to his satisfaction, this inspection shall constitute the final inspection and the City Engineer will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of the final inspection.

If, however, the inspection discloses any work in whole or in part, as being unsatisfactory, the City Engineer will give the Contractor the necessary instructions for correction of such work, and the Contractor shall immediately comply with and execute such instructions. Upon correction of the work, another inspection will be made which shall constitute the final inspection provided the work has been satisfactorily completed. In such event, the City Engineer will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

MEASUREMENT AND PAYMENT (continued)

6. ACCEPTANCE AND FINAL PAYMENT

(a) When the project has been accepted and upon submission by the Contractor of all required reports, completed forms and certifications, the Owner will review the final estimate of the quantities of the various classes of work performed. The Contractor may be required to certify that all bills for labor and material used under this contract have been paid.

(b) The Contractor shall file with the Owner any claim that the Contractor may have regarding the final estimate at the same time the Contractor submits the final estimate. Failure to do so shall be a waiver of all such claims and shall be considered as acceptance of the final estimate. From the total amount ascertained as payable, an amount equal to ten percent (10%) of the whole will be deducted and retained by the Owner for the guaranty period. This retainage may be waived, at the discretion of the City, provided the required Maintenance Bond has been posted. After approval of the final estimate by the Owner, the Contractor will be paid the entire sum found to be due after deducting all previous payments and all amounts to be retained or deducted under the provisions of the contract.

(c) All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

7. GENERAL GUARANTY AND WARRANTY OF TITLE

(a) Neither the final certification of payment nor any provision in the contract nor partial or entire use of the improvements embraced in this Contract by the Owner or the public shall constitute an acceptance of work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express or implied warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of twelve (12) months from the date of final acceptance of the work. The Owner will give notice of defective materials and work with reasonable promptness.

(b) No material, supplies or equipment to be installed or furnished under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale, lease purchase or other agreement by which an interest therein or in any part thereof is retained by the Seller or supplier. The Contractor shall warrant good title to all materials, supplies and equipment installed or incorporated in the work and upon completion of all work, shall deliver the same together with all improvements and appurtenances constructed or placed thereon by him to the Owner free from any claims, liens or charges. Neither the Contractor nor any person, firm or corporation furnishing any material or labor for any work covered by this Contract shall have the right to a lien upon any improvements or appurtenances thereon.

Nothing contained in this paragraph, however, shall defeat or impair the right of persons furnishing materials or labor to recover under any bond given by the Contractor for their protection or any rights under any law permitting such persons to look to funds due the Contractor in the hands of the Owner. The provisions of this paragraph shall be inserted in all subcontractors and material contracts and notice of its provisions shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

MEASUREMENT AND PAYMENT (continued)

8. NO WAIVER OF LEGAL RIGHTS

(a) Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of acceptance. Such final acceptance, however, shall not preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Owner be precluded or be stopped from recovering from the Contractor or his Surety, or both, such overpayment as it may sustain by failure on the part of the Contractor to fulfill his obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

(b) The Contractor, without prejudice to the Contract shall be liable to the terms of the Contract, shall be liable to the Owner for latent defects, fraud or such gross mistakes as may amount to fraud, and as regards the Owner's right under any warranty or guaranty.

9. TERMINATION OF CONTRACTOR'S RESPONSIBILITY

Whenever the improvement provided for by the Contract shall have been completely performed on the part of the Contractor and all parts of the work have been released from further obligations except as set forth in his bond and as provided in Section 8 above.

SHOP DRAWINGS

The Contractor shall submit working and detail drawings, well in advance of the work, to the City Engineer for review.

The Contractor's drawings shall consist of shop detail, erection and other working plans showing dimensions, sizes and quality of material, details and other information necessary for the complete fabrication and erection of the pertinent work.

The Contractor shall submit two sets of drawings to the City Engineer.

Prior to the approval of the drawings, any work done or materials ordered for the work involved shall be at the Contractor's risk.

One set of the drawings will be returned to the Contractor approved or marked with corrections to be made. After approval has been given, the Contractor shall supply the City Engineer with two sets of the revised detail working drawings.

The City Engineer's approval of the Contractor's working drawings will not relieve the Contractor from responsibility for errors in dimensions or for incorrect fabrication processes, or from responsibility to complete the contract work.

TECHNICAL SPECIFICATIONS

Section 07920 - Sealants and Caulking

This specification describes the sealing of joints and cracks with a two-component, non-sag or self-leveling, elastomeric, polyurethane sealant.

Part 1 - General Conditions - Cracks, expansion joints, control joints and cant beads

1.01 Work Included

A. Furnish all materials, labor, tools, and equipment for the repair of structural and non-structural cracks as designated by the Owner.

1.02 Quality Assurance

A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.

B. Contractor qualifications: Contractors shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by the manufacturer's representative.

C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state, and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 Delivery, Storage, and Handling

A. Deliver the specified product in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers.

B. Store and condition the specified product as recommended by the manufacturer.

1.04 Job Conditions

A. Environmental Conditions: Do not apply material if it is raining or snowing or if they appear to be imminent.

B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified repair material.

1.05 Compensation

A. Method of measurement: The repair or replacement of sealant joints shall be measured by the lineal foot in place and the quantity to be paid for shall be the lineal feet actually placed.

B. Basis of Payment: The repair or replacement of sealant joints shall be paid for at the contract unit bid price per lineal foot as stipulated in the schedule of Bid Prices, which payment shall be full compensation for furnishing and installing all materials, labor, tools, equipment, and other incidentals necessary to complete the specified operation. Payment will be made on the percentage of the work completed during each estimate period as determined by the Owner.

Part 2 - Surface Preparation

A. The cracks and adjacent substrate must be clean, sound and free of frost. Remove dust, laitance, grease, curing compounds, waxes, impregnations, foreign particles, efflorescence and other bond inhibiting materials from the surface by mechanical means, i.e. - sandblasting, high pressure waterblasting, etc., as approved by the Engineer.

1. Polyurethane sealant - with a mechanical router or hand chipping tool create a notch with a minimum depth of a ¼". Remove all loose debris. Substrate must be dry prior to product application.

Part 3 - Scope: Product and Application

3.01 Acceptable Manufacturers

A. Sikaflex-2c, as manufactured by Sika Corporation, Lyndhurst, New Jersey, is considered to conform to the requirements of this specification and has performed satisfactorily for joint sealing for a minimum of three years.

B. Substitutions: The use of other than the specified product will be considered providing the contractor requests its use in writing to the Engineer. This request shall be accompanied by (a) A certificate of compliance from an approved independent testing laboratory that the proposed substitute product meets or exceeds the specific performance criteria, tested in accordance with the specified test standards; and (b) Documented proof that the proposed substitute product has a three year proven record of performance of joint sealing, confirmed by actual field tests and five successful installations that the Engineer can investigate.

3.02 Performance Criteria

A. Properties of the mixed polyurethane sealant:

1. Pot Life: 3-4 hours
2. Initial Cure (Tack-Free Time): 6-8 hours
3. Consistency: non-sag/self-leveling
4. Color: 40 architectural colors standard via color pack system

B. Properties of the cured polyurethane sealant:

1. Tensile Properties (ASTM D-412) at 14 days
a. Tensile Strength: 175 psi min.
b. Elongation at Break: 650% min.
c. Tensile Stress at 100% Elongation: non-sag 75 psi, self-leveling 100 psi
2. Hardness (ASTM D-2240) at 14 days: (Shore A)
a. Non-sag: 30 max.
b. Self-leveling: 45 max.
3. Tear Strength (ASTM D-624) at 14 days: non-sag 75 lbs/in, self-leveling 100 lbs/in
4. Adhesion in Peel (TT-S-00227E) at 21 days
a. Concrete: 20 lb. min.
b. Aluminum: 25 lb. min.
c. Glass: 25 lb. min.
5. Service Range: -40 to 170F
6. The sealant shall conform to Federal Specification TT-S-00227E, Type I and II, Class A.
7. The sealant shall conform to ASTM C-920, Type M, Grade P or NS, Class 25.

8. The sealant shall be capable of ±50% of the average joint width when tested in accordance to the durability
bond test of Federal Specification TT-S-00227E.
9. The sealant shall be non-staining.
10. Final Cure: 3 days max.

3.03 Materials

A. Polyurethane sealant:

1. The joint sealant shall be a two-component, non-sag or self-leveling, polyurethane-base material. It shall be applicable in horizontal, vertical, and overhead joints. The sealant shall be principally a chemical cure to form an elastomeric substance. The color shall be introduced through a color-pak system.

B. Any primers, as required, recommended by the manufacturer of the specified product, approved by the Engineer. Sika 260/205 Metal Primer recommended for metal expansion joints repairs.

C. Backer rod or bond breaker tape, as approved by the Engineer.

3.02 Mixing & Application

A. Mixing of the polyurethane sealant: Pour out entire contents of Component B into pail of Component A. Now add entire contents of color-pak into pail and mix with low-speed drill (400-600 rpm) and approved paddle. Mix for 5-7 minutes to achieve a uniform color and consistency. Avoid entrapment of air during mixing.

B. Joints

1. Placement Procedure: Prime all substrates only as required based upon the recommendations of the manufacturer of the specified product, when field testing indicates need, and when the joints will be subject to immersion after cure, as approved by the Engineer.

2. Install approved backer rod or bond breaker tape in all joints subject to thermal movement to prevent three sided bonding and to set the depth of the sealant. Approval of the backer rod or bond breaker tape shall be made by the Engineer.

3. Joints shall be masked to prevent discoloration or application on unwanted areas, as directed by the Engineer. If masking tape is used, it shall not be removed before tooling, yet must be removed before the initial cure of the sealant. Do not apply the masking tape until just prior to the sealant application.

4. Install sealant into the prepared joints when the joint is at mid-point of its designed expansion and contraction.

a. Non-sag sealant: Load the sealant into a caulking gun. Place the nozzle of the gun, either hand or air or electric powered, into the bottom of the joint and fill entire joint. Keep the tip of the nozzle in the sealant, continue on with a steady flow of sealant proceeding the nozzle to avoid air entrapment. Avoid overlapping the sealant to eliminate the entrapment of air. Tool, as required, to properly fill the joint.

b. Self-leveling sealant: Pour or extrude the sealant into the prepared joint in one direction and allow it to flow and level as necessary. Avoid overlapping the sealant to eliminate the entrapment of air. Tool, as required, to properly fill the joint.

5. Adhere to all limitation and cautions for the polyurethane sealant as stated in the manufacturers printed literature.

B. Cracks

1. Non-sag sealant: For best performance sealant should be gunned into crack to a minimum of 1/4" in depth. Place the nozzle of the gun, either hand or air or electric powered, into the bottom of the joint and fill entire joint. Keep the tip of the nozzle in the sealant, continue on with a steady flow of sealant proceeding the nozzle to avoid air entrapment. Avoid overlapping the sealant to eliminate the entrapment of air. Tool, as required, to properly fill the joint.

2. Self-leveling sealant: Pour or extrude the sealant into the prepared crack in one direction and allow it to flow and level as necessary. Avoid overlapping the sealant to eliminate the entrapment of air. Tool, as required, to properly fill the joint.

3. Adhere to all limitation and cautions for the polyurethane sealant as stated in the manufacturers printed literature.

3.05 Cleaning

A. The uncured polyurethane sealant can be cleaned from tools with an approved solvent. The cured polyurethane sealant can only be removed mechanically.

B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas. Note: Tests were performed with material and curing conditions at 71-75 F and 45-55% relative humidity.

Sikaflex® 2c NS/SL
Expansion Joint Filler

Figure 1 - Sikaflex 2c NS (non-sag)

1. Install appropriate backer material to prevent three-sided adhesion and to control sealant depth.
2. Sikaflex 2c NS should be gunned into joint at mid-point of designed expansion and contraction.
3. Tool as required to properly fill joints.

Note: Sikaflex-2c NS is designed for all types of joints where maximum sealant depth will not exceed ½".

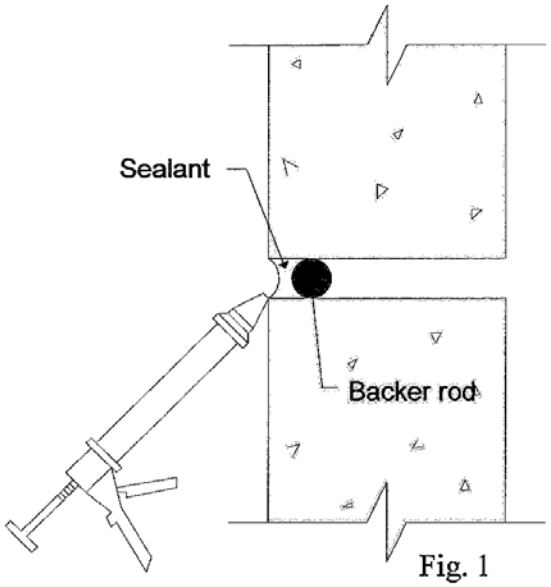


Fig. 1

Figure 2 - Sikaflex 2c SL (self-leveling)

1. Pour Sikaflex 2c SL into prepared joint, allow to flow and level as necessary. Minimum depth ¼".
2. Tool as required to properly fill joint.

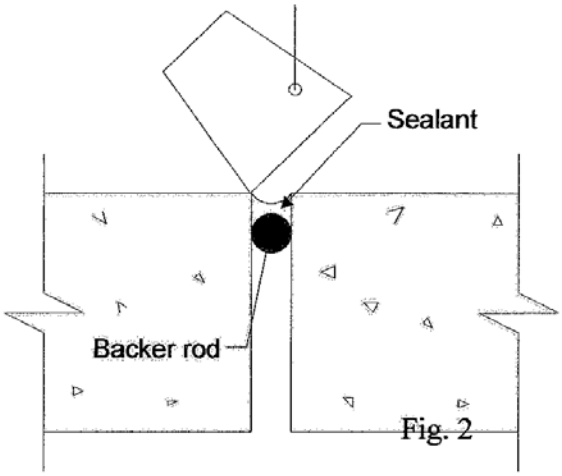
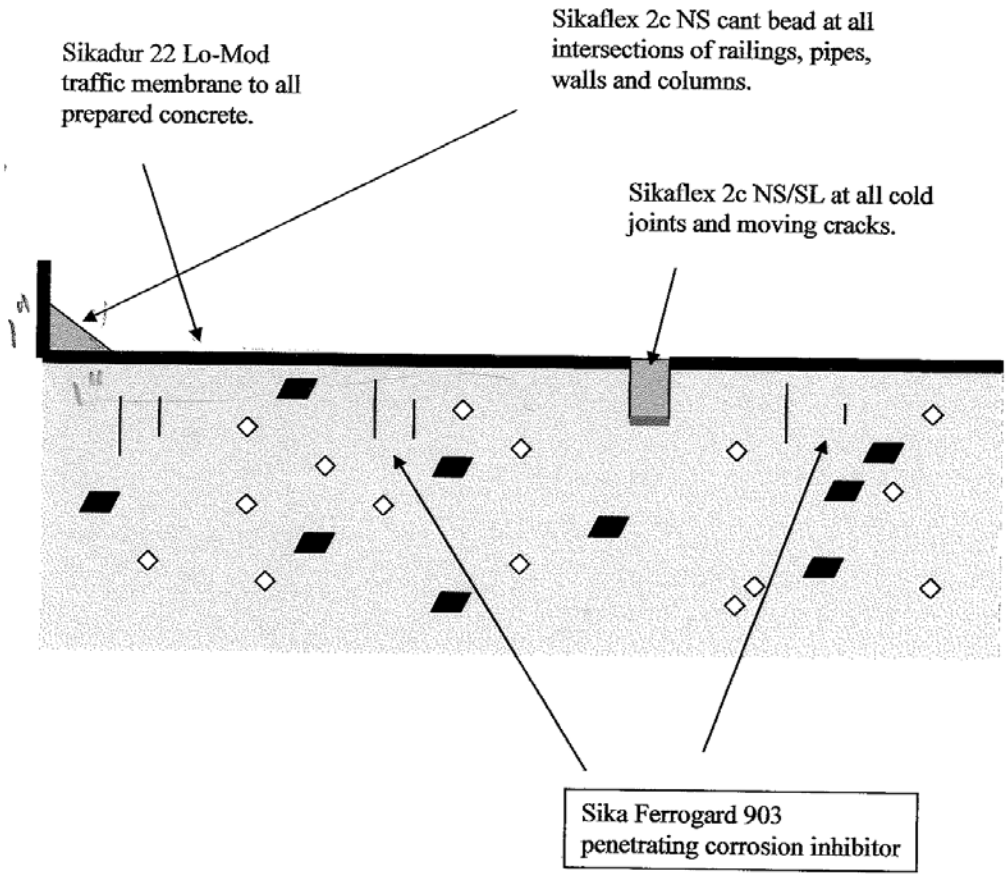


Fig. 2

Sikaflex® 2c NS/SL
Cold Joint Detail



Sikaflex® 2c NS/SL Crack Filler

Figure 1 - Sikaflex 2c NS (non-sag)

1. Gun Sikaflex 2c NS into prepared crack, minimum depth ¼".
2. Tool as required to properly fill crack.

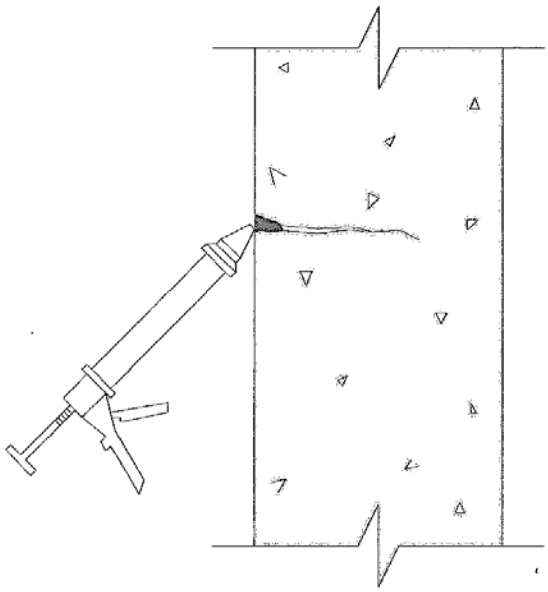


Fig. 1

Figure 2 - Sikaflex 2c SL (self-leveling)

1. Pour Sikaflex 2c SL into prepared crack, allow to flow and level as necessary. Minimum depth ¼", ½" in direct traffic areas.
2. Tool as required to properly fill crack.

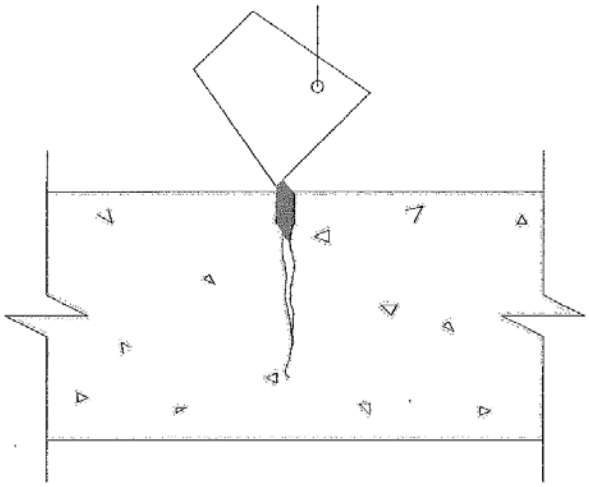


Fig. 2

SECTION 07912
EXPANSION JOINTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Requirements of the General Conditions are hereby made a part of this Section to the same extent as if repeated herein.

B. The Contractor shall coordinate work with that of other trades affecting or affected by the work included under this section and shall cooperate with such trades, the Engineer and the Owner to ensure steady and timely progress of the work.

C. The Contractor agrees to accept the results of any tests secured by a qualified Testing Laboratory engaged by the Owner.

D. Where referred to, Standard Specification of technical societies, manufacturers' associations and federal agencies shall be the latest edition and include all amendments current as of the date of issue of these specifications.

1.02 SECTION INCLUDES

A. Removal and replacement of existing floor slab expansion joints at locations shown on plans, in accordance with the details and specifications. Work shall include furnishing all labor, materials, and incidentals required to prepare existing conditions, provide materials and install the new expansion joint as shown on the Contract Drawings.

1.03 RELATED SECTIONS

A. Section 07900: Joint Sealants

1.04 SUBMITTALS

A. Shop Drawings: Provide installation plans, details, as-built conditions, manufacture product data sheets, and necessary information for expansion joint work as indicated on the Contract Drawing.

B. Material samples.

C. All information required to define joint placement and methodology of installation.

D. Warranty: Furnish written guarantee the expansion joint system will be free of workmanship, material or system design defects. The expansion joint system, workmanship, and materials shall be guaranteed to be free of leaks for a 5 year period. Repairs within warranty period shall be performed at no cost to the

Owner. Warranty will not be required to cover excessive conditions such as snow-plow damage. Expansion joint replacement work shall not commence until warranty has been approved by the Engineer or Owner.

E. Substitutions: Any request for the product substitution must be submitted with all the necessary documentation, testing, and warranty information for the Engineer's review and approval:

1. Proposed substitution subject to rejection by Engineer without qualification.

1.05 REFERENCES

ASTM D 2240 Test for Identification Hardness of Rubber and Plastics by Means of a Durometer

1.06 QUALITY ASSURANCE

A. General

1. Provide written certification that the System Installer has been approved by the Manufacturer.

2. The Installer shall provide evidence of satisfactory installation of similar systems for a period of not less than five years.

a. Submit a listing of no less than five installations in a climate similar to that for this project.

3. Submit certification that products and installations comply with applicable EPA, VOC and OSHA requirements regarding health and safety hazards.

4. Manufacturer's technical representative shall be on site during the initial installation of the expansion joints to ensure proper installation procedures.

B. The manufacturer shall review and approve all details prior to installation and confirm its approval in writing to the Engineer.

C. The manufacturer shall provide test reports on the gland material attesting to the result of the Shore "A" hardness testing in accordance with ASTM D2240.

1.07 DELIVERY AND STORAGE

A. Deliver all materials to the site in original, unopened containers bearing the following information:

1. Name of product.

2. Name of manufacturer.

3. Date of preparation or manufacture.

4. Lot or batch identification.

B. Store materials on blocks or skids under cover and protect from weather. Replace packages or materials showing any signs of damage with new materials at no additional cost to the Owner.

1. Do not store material directly in contact with slabs or grade.

PART 2 PRODUCTS

2.01 MATERIALS

A. Contractor shall field verify existing joint width, configuration and all other conditions that may affect the joint size and selection. Expansion Joint System shall be:

1. "Wabocrete 201 - type ME 225, ME 300, ME 400 System" by Watson Bowman Acme Corporation.

2. "ThermaFlex - TCR 300, 400 Series" by Emseal.

3. Approved equivalent product as approved by the Engineer.

PART 3 EXECUTION

3.01 INSPECTION

A. General:

1. Inspect surfaces to receive the work of this Section and report immediately in writing to the Engineer any deficiencies in the surface preparation which render it unsuitable for proper execution of the work.

2. Coordinate with related work contractors and verify that the related work meets the following requirements:

a. Prepared concrete surfaces are finished appropriately to receive the work for this Section.

b. Repaired concrete surfaces have endured the proper curing period for the system selected.

c. Field verify joint width prior to submission of expansion joint material.

3. Acid etching is prohibited.

3.02 PREPARATION

A. Check adhesion to substraits and recommend appropriate preparatory measures.

B. Proceed with expansion joint installation only after unsatisfactory conditions have been corrected in a manner satisfactory to the Installer.

C. Clean joints thoroughly in accordance with manufacturer's instructions to insure all laitance, unsound concrete and curing compounds which may interfere with adhesion.

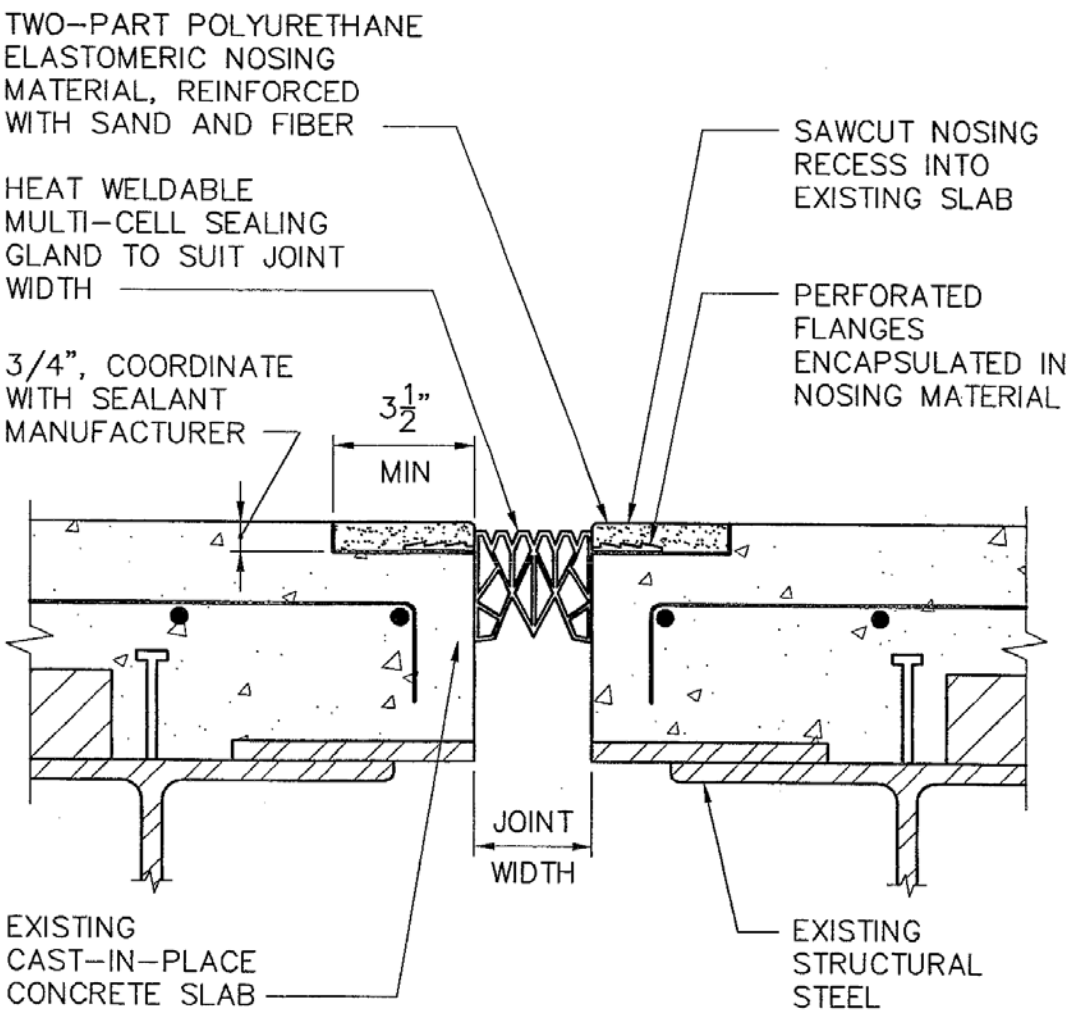
D. Where joint opening provided, is less than the minimum width required for installation and for movement anticipated, sawcut or grind edges to increase opening width to the required minimum.

E. Cease installation work when adverse weather conditions or temperatures are beyond the manufacturer's recommendations.

3.03 INSTALLATION

A. Complete all work as shown on the Contract Drawings in strict accordance with the Manufacturer's written instruction and specifications including, but not limited to, the moisture content of the substrate, the atmospheric condition (including relative humidity and temperature), coverages and texture.

END OF SECTION



B EXPANSION JOINT DETAIL
3"=1'-0"

NOTE: CONTRACTOR TO FIELD VERIFY JOINT WIDTH PRIOR TO SUBMISSION OF SHOP DRAWING. TOTAL JOINT MOVEMENT 1.25" TO 1.5".

TEMPERATURE (F)	VOLUME CHANGE
80°	0"
60°	0.35"
40°	0.69"

CITY OF PORTSMOUTH, NH
DEPARTMENT OF PUBLIC WORKS
HIGH & HANOVER STREET PARKING FACILITY
FAY, SPOFFORD & THORNDIKE, INC.
ENGINEERS - PLANNERS - SCIENTISTS
BURLINGTON, MA

FS&T PROJECT NUMBER	SCALE: 3"=1'-0"	DES. DMD	CHK. WJW	APPROVED
BG-041	DATE: 09-28-01	DR. DMD		

DIVISION 3 – CONCRETE
Section –09870

This specification describes the treatment of concrete surfaces with a penetrating corrosion inhibitor to reduce the effects of corrosion in reinforced concrete in the garage.

Part 1 – General Conditions – Impregnation Corrosion Inhibitor Treatment

1.01 Work Included

A. Furnish all materials, labor, tools, and equipment to treat horizontal concrete surfaces with an impregnation coating as designated by the Engineer or Owner.

1.02 Quality Assurance

A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.

B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.

C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

D. Manufacturer must be capable of testing on-site to prove the presence of the corrosion inhibitor at the specified depth. This testing is to be provided free of charge to the owner.

1.03 Delivery, Storage, and Handling

A. All materials must be delivered in original, unopened containers with the manufacturer’s name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.

B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.

C. Condition the specified product as recommended by the manufacturer.

1.04 Job Conditions

A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40ºF (5ºC) and rising.

B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.

1.05 Submittals

A. Submit two copies of manufacturer’s literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).

B. Corrosion rate field monitoring using linear polarization resistance by an independent, qualified monitoring and management company demonstrating an ability to reduce corrosion rates by a minimum of 65%.

C. Proof of compliance with the properties specified in Section 3.02 Performance Criteria.

1.06 Warranty

A. Provide a written warranty from the manufacturer against defects of materials for a period of five (5) years, beginning with date of substantial completion of the project.

1.07 Compensation

A. Method of measurement: The impregnation coating work with the specified material shall be measured by the square foot in place and the quantity to be paid for shall be the square feet actually placed.

B. Basis of Payment: The impregnation coating work with the specified material will be paid for at the contract unit bid price per square foot, as stipulated in the schedule of Bid Prices, which payment shall be full compensation for furnishing and installing all materials, labor, tools, equipment, and other incidentals necessary to complete the specified operation. Payment will be made on the percentage of the work completed during each estimate period as determined by the Engineer or Owner.

Part 2 – Products

2.01 Manufacturer

A. **Sika FerroGard 903**, as manufactured by Sika Corporation, Lyndhurst, New Jersey, is considered to conform to the requirements of this specification and has performed satisfactorily in the proposed application for a minimum of five years.

B. Substitutions: The use of other than the specified product will be considered providing the contractor requests its use in writing to the Engineer a minimum of one week before bid date for the engineers review. This request shall be accompanied by (a) A certificate of compliance from an approved independent testing laboratory that the proposed substitute product meets or exceeds the specific performance criteria, tested in accordance with the specified test standards; and (b) Documented proof that the proposed substitute product has a five year proven record of performance of coating of substrates, confirmed by actual field tests and five successful installations that the Engineer can investigate.

C. Certification from the manufacturer demonstrating compliance with the ISO 9000 quality standard in the development, manufacture, and sale of the product.

2.02 Materials

A. General: Penetrating corrosion inhibiting impregnation coating

1. The material shall be a organic and inorganic in nature and environmentally safe.
2. The materials shall be water based.
3. The materials shall be not contain calcium nitrite.
4. The material shall not form a vapor barrier.
5. The material shall be a mixed inhibitor that provides a protective coating to both the anodic and cathodic surfaces of the reinforcing steel measured at 100A thickness.

2.03 Performance Criteria

A. Typical Properties of the penetrating corrosion inhibiting impregnation coating::

1. Viscosity (Brookfield Viscometer, Spindle #1, Speed 100) 15 cps.
2. Color: Pale Yellow
3. Density: 1.13 (9.4 lbs./ gal.)
4. PH: 11 (+/-1)
5. Flash point: None (water-based)

B. Corrosion testing of penetrating corrosion inhibiting impregnation coating::

1. The material must form a continuous film on the reinforcing steel and displace chlorides ions from the steel surface (X-ray Photon Spectroscopy (XPS) and Secondary Ion Mass Spectroscopy (SIMS).

2. The material must penetrate independently of orientation (horizontal, vertical, overhead) at a rate up to 1/10 to 4/5 inches (2.5 to 20 mm) per day, depending on density of concrete. (Secondary Neutron Mass Spectroscopy (SNMS).

3. The material must have demonstrated the reduction in corrosion currents after treatment as calculated by the Cracked Beam Corrosion Tests of concrete. (Adapted from ASTM G 109)

4. The material must form a protective layer on the reinforcing steel of high integrity measured at 100A thickness. (X-ray Photon Spectrocopy and Secondary ion Mass Spectroscopy).

5. The material must penetrate up to 3 inches (76 mm) in 28 days. (Secondary Nuetron Mass Spectroscopy).

6. The material must be capable of reducing active corrosion rates on the steel by a minimum of 65%. This reduction shall be demonstrated by project references and an independent corrosion engineer using linear polarization resistance.

Note: Tests above were performed with the material and curing conditions @ 71^{o}F – 75^{o}F and 45-55% relative humidity.

Part 3 – Execution

3.03 Surface Preparation

A. All substrates to be coated must be clean, sound and free of surface contaminants. Remove dust, laitance, grease, oils, curing compounds, form release agents, and all other foreign particles from the surface by mechanical means, i.e. - sandblasting, high pressure waterblasting, etc., as approved by the Engineer. All projections, rough spots, etc. shall be dressed off. Substrate should be in accordance with ICRI Guideline No. 03732 for coatings and fall within CSP1 and CSP3.

1. Migrating Corrosion Inhibiting Impregnation Coating - substrate must be dry prior to application of the Sika Ferrogard 903.

3.04 Mixing and Application

A. Placement Procedure: The migrating corrosion inhibiting impregnation coating should be applied liberally and allowed to soak into the substrate. This shall be accomplished by the use of rollers, brushes, a conventional airless spray system, or hand - pressure spray system.

B. Apply Sika Ferrogard 903 at a total minimum consumption rate 200 sf/gallon/coat by brush, roller, or low pressure spray in two coats (dependent on absorbency) for a total consumption of 100 sf./gallon.

Note: When Sika Ferrogard 903 is to be applied before Sika mortars thoroughly wash down surfaces using clean water. Any white powdery residue must be removed by water jetting using adequate volume and pressure
Note: Best results are usually obtained by low pressure spray application.
Note: Between applying the subsequent coats of Sika Ferrogard 903 allow the previous coats to absorbed into the concrete and dry (approximately 1-6 hours minimum dependent on temperature and humidity).
Note: The treated area should be protected from rain or frost for a period of at least 24 hours after application of Sika Ferrogard 903.

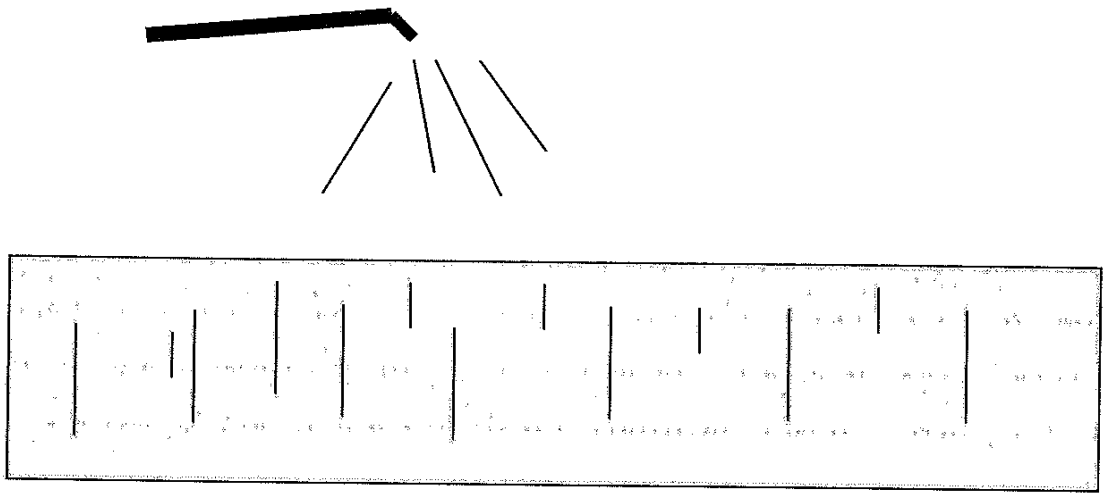
C. After 24 hours of curing thoroughly wash down surfaces treated using clean water. Any white powdery residue must be removed by water jetting using adequate volume and pressure.
Note: Best results are usually obtained by low pressure spray application.

D. Adhere to all procedures, limitations and cautions for this product in the manufacturers current printed technical data sheet and literature.

3.05 Cleaning

A. The material can be cleaned from tools with water.
B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

Sika Ferrogard 903 Penetrating Corrosion Inhibitor



1. Be sure all surfaces are clean, sound and free of standing water.
2. Apply Sika Ferrogard 903 by brush, roller or sprayer. If spraying use conventional airless or pump sprayers.
3. Apply two coats at 200 sq.ft./gallon per coat.
4. Wait 24 hours and rinse treated surfaces to remove the surfactant residue.

Section 03730 – Concrete Rehabilitation

This specification describes the grouting of cracks by gravity flow with epoxy resin adhesives.

Part 1 – General Conditions – Cracks

1.1 Work Included

A. Furnish all materials, labor, tools, and equipment for the repair of structural and non-structural cracks as designated by the Owner or owner's agent.

1.2 Quality Assurance

A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.

B. Contractor qualifications: Contractors shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more in the use of the specified repair material. Contractor shall maintain qualified personnel who have received product training from the manufacturer's representative.

C. Install materials in accordance with all safety conditions required by the manufacturer or as modified by applicable rules and regulations of local, state, and federal authorities having jurisdiction. Consult the manufacturer's current printed literature and Material Safety Data sheets on the specified product for the complete use, storage, handling and disposal recommendations.

1.3 Delivery, Storage, and Handling

A. Deliver the specified product in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers.

B. Store and condition the specified product as recommended by the manufacturer.

C. Condition the specified as recommended by the manufacturer.

1.4 Job Conditions

A. Environmental Conditions: Do not apply material if it is raining, or snowing or if they appear to be imminent.

B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified repair material.

1.5 Compensation

A. Method of measurement: The repair of structural and non-structural cracks shall be measured by the

cubic/square/lineal foot in place and the quality to be paid for shall be the cubic/square/lineal feet actually placed.

B. Basis of Payment: The repair of the structural and non-structural cracks will be paid for at the contract unit bid price per cubic/square/lineal foot as stipulated in the schedule of Bid Prices, which shall be full compensation for furnishing and installing all, materials, labor, tools, equipment, and other incidentals necessary to complete the specified operation. Payment will be made on the percentage of the work completed during each estimate period as determined by the Owner.

Part 2 – Surface Preparation

A. The cracks and adjacent substrate must be clean, sound and free of frost. Remove dust, laitance, grease, curing compounds, waxes, impregnations, foreign particles, efflorescence and other bond inhibiting materials from the surface by mechanical means, i.e. – sand blasting, high pressure waterblasting, etc., as approved by the Engineer.

1. Epoxy resin adhesive – repair area may be dry or damp, but free of standing water prior to product application. (Fig. 1)

Part 3 - Scope: Product and Application

3.01 Acceptable Manufacturers

A. Sikadur 35, Hi-Mod LV, as manufactured by Sika Corporation, Lyndhurst, New Jersey, is considered to conform to the requirements of this specification and has performed satisfactorily for grouting cracks by gravity flow for a minimum of ten years.

B. Substitutions: The use of other than the specified product will be considered providing the contractor requests its use in writing to the Engineer. This request shall be accompanied by (a) A certificate of compliance from an approved independent testing laboratory that the proposed substitute product meets or exceeds the specified performance criteria, tested in accordance with the specified test standards; and (b) Documented proof that the proposed substitute product has a ten year proven record of performance of grouting cracks by gravity flow, confirmed by actual field tests and five successful installations that the Engineer can investigate.

3.02 Performance Criteria

A. Properties of the mixed epoxy resin adhesive:

1. Pot Life: 20-30 minutes

2. Tack-Free Time to Touch (3-5 mils): 2.5-4 hours

3. Initial Viscosity (Brookfield Viscometer, Spindle #2; Speed 100): 300-450 cps

4. Color: clear, amber

B. Properties of the mixed epoxy resin adhesive:

1. Compressive Properties (ASTM D-695) at 28 days

   a. Compressive Strength: 10,000 psi min
   b. Modulus of Elasticity: 300,000 psi min

2. Tensile Properties (ASTM D-638) at 14 days

a. Tensile Strength: 7000 psi min
b. Elongation at Break: 3-5%
c. Modulus of Elasticity: 300,000 psi min

3. Flexural Properties (ASTM D-790) at 14 days

a. Flexural Strength (Modulus of Rupture): 12,000 psi min.
b. Tangent Modulus of Elasticity in Bending: 300,000 psi min

4. Shear Strength (ASTM D-732) at 14 days: 4500 psi min

5. Total Water Absorption (ASTM D-570) at 7 days: 1.5% max. (2 hour boil)

6. Bond Strength (ASTM C-882) Hardened Concrete to Hardened Concrete

a. 2 day (dry cure): 2400 psi min
b. 14 day (moist cure): 2300 psi min

7. Deflection Temperature (ASTM D-648) at 14 days: 108F min (fiber stress loading = 264 psi)

8. Vicat Softening Temperature (ASTM D-1525) at 14 days: 210F min.

9. The epoxy resin adhesive shall conform to ASTM C-881, and AASHTO M235-90.

10. The epoxy resin adhesive shall be approved by the United States Department of Agriculture.

3.03 Materials

A. Epoxy resin adhesive:
1. Component “A” shall be a modified epoxy resin of the epichlorohydrin bisphenol A type containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.

2. Component “B” shall be primarily a reaction product of a selected amine blend with an epoxy resin of the epichlorohydrin bisphenol A type containing suitable viscosity control agents and accelerators.

2. The ratio of Component “A”: Component “B” shall be 2:1 by volume.

3.04 Mixing and Application

A. Mixing the epoxy resin adhesive: Premix each component. Proportion two parts of Component “A” to one part Component “B” by volume into a clean, dry mixing pail. Mix thoroughly for 3 minutes min. with a jiffy paddle on a low-speed (400-600 rpm) drill. Mix only that quantity of material that can be used within its pot life (20-30 minutes at 73F).

B. Placement Procedure: Place the mixed epoxy resin adhesive into the vee notch. Replenish the reservoir with the mixed epoxy resin adhesive until the cracks have been completely filled.

C. If penetration of any crack is impossible, consult the Engineer before discontinuing the procedure. If modification of the proposed procedure is required to fill the cracks, submit said modification in writing to the Engineer for acceptance prior to proceeding.

D. Adhere to all limitations and cautions for the epoxy resin adhesive in the manufacturers current printed literature.

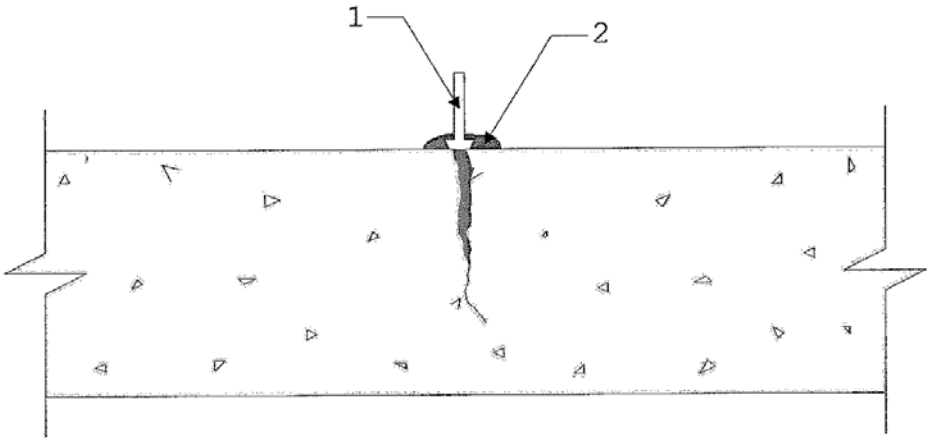
3.05 Cleaning

A. The uncured epoxy resin adhesive can be cleaned from tools with an approved solvent. The cured epoxy resin adhesive can only be removed mechanically.

B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

Note: Tests were performed with material and curing conditions at 71-75F and 45-55% relative humidity.

Sikadur® 35, Hi-Mod LV/ Sikadur® 31, Hi-Mod Gel Crack Filler / Cap Seal



1. Set porting devices over cracks.
2. Place mixed Sikadur 31, Hi-Mod Gel epoxy resin adhesive over cracks and around each injection port a minimum of 1" wide by a ¼" thick.
3. Allow sufficient time for epoxy resin adhesive cap seal to set before injecting.
4. When the cap seal has cured, inject Sikadur 35, Hi-Mod LV with steady pressure.
5. Use automated injection equipment or manual method.

Section 03730 - Concrete Rehabilitation

This specification describes the pressure injection of cracks with epoxy resin adhesives.

Part 1 - General Conditions - Cracks Requiring Epoxy Injection

1.01 Work Included

A. Furnish all materials, labor, tools, and equipment for the repair of structural and non-structural cracks as designated by the Owner.

1.02 Quality Assurance

A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.

B. Contractor qualifications: Contractors shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by the manufacturer's representative.

C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state, and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 Delivery, Storage, and Handling

A. Deliver the specified product in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers.

B. Store and condition the specified product as recommended by the manufacturer.

1.04 Job Conditions

A. Environmental Conditions: Do not apply material if it is raining or snowing or if they appear to be imminent.

B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified repair material.

1.05 Compensation

A. Method of measurement: The repair of structural and non-structural cracks shall be measured by the lineal foot in place and the quantity to be paid for shall be the lineal feet actually placed.

B. Basis of Payment: The repair of the structural and non-structural cracks will be paid for at the contract unit bid price per lineal foot as stipulated in the schedule of Bid Prices, which payment shall be full compensation for furnishing and installing all materials, labor, tools, equipment, and other incidentals necessary to complete the specified operation. Payment will be made on the percentage of the work completed during each estimate period as determined by the Owner.

Part 2 - Surface Preparation

A. The cracks and adjacent substrate must be clean, sound and free of frost. Remove dust, laitance, grease, curing compounds, waxes, impregnations, foreign particles, efflorescence and other bond inhibiting materials from the surface by mechanical means, i.e. - sandblasting, high pressure waterblasting, etc., asapproved by the Engineer.

1. Epoxy resin adhesive - repair area may be dry or damp, but free of standing water

Prior to product application.(Fig. 1)

Part 3 - Scope: Product and Application

3.01 Acceptable Manufacturers

A. Epoxy resin adhesives:

1. Sikadur 35, Hi-Mod LV, as manufactured by Sika Corporation, Lyndhurst, New Jersey, is considered to conform to the requirements of this specification and has performed satisfactorily for the pressure injection grouting of cracks for a minimum of ten years.

2. Sikadur 31, Hi-Mod Gel, as manufactured by Sika Corporation, Lyndhurst, New Jersey, is considered to conform to the requirements of this specification and has performed satisfactorily for the sealing of cracks and porting devices for the pressure injection grouting of cracks for a minimum of ten years.

3.02 Performance Criteria

A. Properties of the mixed epoxy resin adhesive used for the pressure injection grouting:

1. Pot Life: 20-30 minutes
2. Tack-Free Time to Touch (3-5 mils): 2.5-4 hours
3. Initial Viscosity (Brookfield Viscometer, Spindle #2; Speed 100): 300-450 cps
4. Color: clear, amber

B. Properties of the cured epoxy resin adhesive used for the pressure injection grouting:

1. Compressive Properties (ASTM D-695) at 28 days

    a. Compressive Strength: 10,000 psi min
    b. Modulus of Elasticity: 300,000 psi min

2. Tensile Properties (ASTM D-638) at 14 days

    a. Tensile Strength: 7000 psi min
    b. Elongation at Break: 3-5%
    c. Modulus of Elasticity: 340,000 psi min

3. Flexural Properties (ASTM D-790) at 14 days

    a. Flexural Strength (Modulus of Rupture): 12,000 psi min.
    b. Tangent Modulus of Elasticity in Bending: 300,000 psi min

4. Sheer Strength (ASTM D-732) at 14 days: 4500 psi min

5. Total Water Absorption (ASTM D-570) at 7 days: 1.5% max. (2 hour boil)

6. Bond Strength (ASTM C-882) Hardened Concrete to Hardened Concrete

    a. 2 day (dry cure): 2400 psi min
    b. 14 day (moist cure): 2300 psi min

7. Deflection Temperature (ASTM D-648) at 14 days: 108F min (fiber stress loading = 264 psi)

8. The epoxy resin adhesive shall conform to ASTM C-881, and AASHTO M235-90.

9. The epoxy resin adhesive shall be approved by the United States Department of Agriculture.

C. Properties of the mixed epoxy resin adhesive used for the sealing of cracks and porting devices:

1. Pot Life: 25-45 minutes

2. Tack-Free Time to Touch: 2-3 hours

3. Consistency (1/2 in. thick): non-sag

4. Color: gray

D. Properties of the cured epoxy resin adhesive used for the sealing of cracks and porting devices:

1. Compressive Properties (ASTM D-695) at 28 days

a. Compressive Strength: 10,000 psi min
b. Modulus of Elasticity: 700,000 psi min

2. Tensile Properties (ASTM D-638) at 14 days

a. Tensile Strength: 3000 psi min
b. Elongation at Break: 0.3% min
c. Modulus of Elasticity: 630,000 psi min

3. Flexural Properties (ASTM D-790) at 14 days

a. Flexural Strength (Modulus of Rupture): 3700 psi min.
b. Tangent Modulus of Elasticity in Bending: 850,000 psi min

4. Shear Strength (ASTM D-732) at 14 days: 3800 psi min

5. Total Water Absorption (ASTM D-570) at 7 days: 1.0% max. (2 hour boil)

6. Bond Strength (ASTM C-882) Hardened Concrete to Hardened Concrete

a. 2 day (dry cure): 2800 psi min
b. 14 day (moist cure): 2000 psi min

7. Deflection Temperature (ASTM D-648) at 14 days: 104F min (fiber stress loading = 264 psi)

8. The epoxy resin adhesive shall conform to ASTM C-881, and AASHTO M235-90.

9. The epoxy resin adhesive shall be approved by the United States Department of Agriculture.

3.03 Materials

A. Epoxy resin adhesive for the pressure injection of cracks:

1. Component “A” shall be a modified epoxy resin of the epichlorohydrin bisphenol A type containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.

2. Component “B” shall be primarily a reaction product of a selected amine blend with an epoxy resin of the epichlorohydrin bisphenol A type containing suitable viscosity control agents and accelerators.

3. The ratio of Component “A”: Component “B” shall be 2:1 by volume.

B. The epoxy resin adhesive for the sealing of cracks and porting devices:

1. Component “A” shall be a modified epoxy resin of the epichlorohydrin bisphenol A type containing suitable viscosity control agents and pigments. It shall not contain butyl glycidyl ether.

2. Component “B” shall be primarily a reaction product of a selected amine blend with an epoxy resin of the epichlorohydrin bisphenol A type containing suitable viscosity control agents, pigments and accelerators.

3. The ratio of Component “A”: Component “B” shall be 2:1 by volume.

4. The material shall not contain asbestos.

C. Porting devices as required for either manual or automated application. Porting devices for automated application shall be supplied from the manufacturer of the pressure injection equipment.

3.04 Mixing and Application

A. Mixing the epoxy resin adhesive for sealing the cracks and porting devices: Premix each component. Proportion two parts of Component “A” to one part Component “B” by volume into a clean, dry mixing pail. Mix thoroughly for 3 minutes min. with a jiffy paddle on a low-speed (400-600 rpm) drill. Mix only that quantity of material that can be used within its pot life (25-45 minutes at 73F).

B. Mixing of the epoxy resin adhesive used for the pressure injection grouting:

1. Manual: Premix each component. Proportion two parts of Component “A” to one part Component “B” by volume into a clean, dry mixing pail. Mix thoroughly for 3 minutes min. with a jiffy paddle on a low-speed (400-600 rpm) drill. Mix only that quantity of material that can be used within its pot life (20-30 minutes at 73F).

2. Automated: The injection equipment is used to meter and mix the two components of the epoxy resin adhesive and dispense the product into the prepared cracks. The unit shall be portable and be equipped with positive displacement-type pumps with interlock to provide positive ratio control of exact proportions of the two components of the epoxy resin adhesive at the nozzle. The pumps shall be air powered or electric and shall provide an in-line mixing and metering system and shall contain drain-back plugs.

C. Placement procedure:

1. The epoxy resin adhesive for sealing the cracks and porting devices: Set porting devices as required by the manufacturer. Spacing of the porting devices should not exceed the thickness of the substrate. Spacing of the
porting devices shall be accomplished as required to achieve the travel of the epoxy resin adhesive for the pressure injection grouting between ports and fill the cracks to the maximum. On structures open on both sides, provide porting devices on opposite sides at staggered elevations. Apply the mixed epoxy resin

adhesive for sealing over the cracks and around each porting device to provide an adequate seal to prevent the escape of the epoxy resin adhesive for the injection grouting. Where required by the Engineer, apply the epoxy resin adhesive for sealing in such a manner that minimal defacing or discoloration of the substrate shall result.

2. The epoxy resin adhesive for the pressure injection grouting:

a. Manual: Load the mixed epoxy resin adhesive for grouting into a disposable caulking cartridge or bulkloading caulking gun. Inject the prepared cracks with a constant pressure in order to achieve maximum filling and penetration without the inclusion of air pockets or voids in the epoxy resin adhesive. Begin the pressure injection at the lowest port and continue until there is the appearance of the epoxy resin adhesive at an adjacent port, thus indicating travel. When travel is indicated, to discontinue or continue the pressure injection from that port should be made by the contractor, based on his experience, with the approval of the Engineer. Continue the procedure until all pressure injectable cracks have been filled.

b. Automated: Dispense the epoxy resin adhesive for grouting under constant pressure in accordance with procedures recommended by the equipment manufacturer or as required to achieve maximum filling and penetration of the prepared cracks without the inclusion of air pockets or voids in the epoxy resin adhesive. The pressure injection of single or multiple ports, by the use of a manifold system, is possible. This decision should be made by the contractor, based upon his experience, with the approval of the Engineer. Continue the approved procedure until all pressure injectable cracks have been filled.

D. If penetration of any cracks is impossible, consult the Engineer before discontinuing the injection procedure. If modification of the proposed procedure is required to fill the cracks, submit said modification in writing to the Engineer for acceptance prior to proceeding.

E. Adhere to all limitation and cautions for the epoxy resin adhesives in the manufacturers current printed literature.

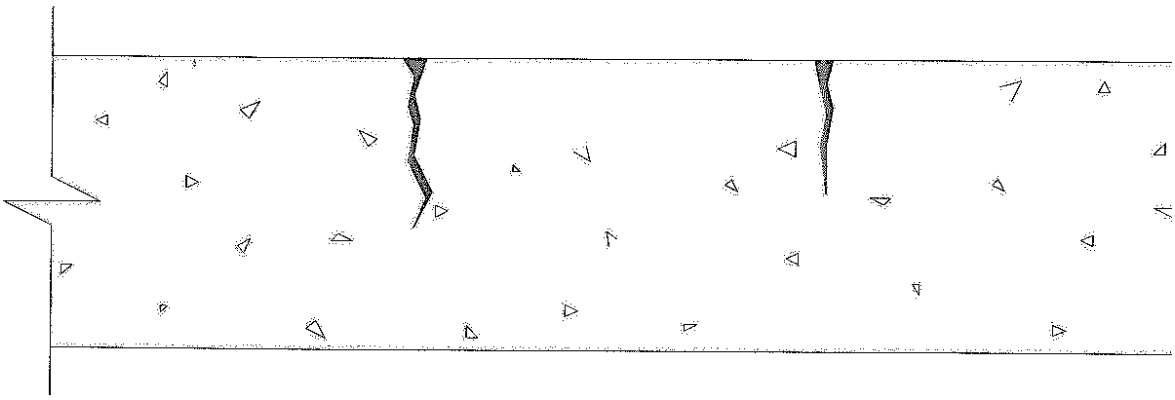
3.05 Cleaning

A. After the epoxy resin adhesive for grouting has cured, the epoxy resin adhesive for sealing cracks and porting devices shall be removed as required by the Engineer. Clean the substrate in a manner to produce a finish appearance acceptable to the Owner.

B. The uncured epoxy resin adhesive can be cleaned from tools with an approved solvent. The cured epoxy resin adhesive can only be removed mechanically.

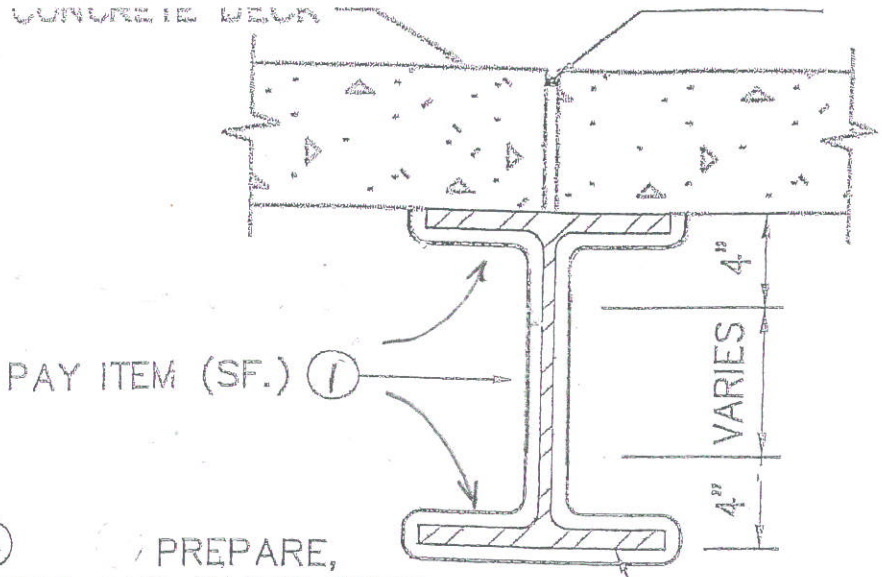
C. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.
Note: Tests above were performed with material and curing conditions at 71-75 F and 45-55% relative humidity.

Sikadur® 35, Hi-Mod LV Crack Filler



1. Pour neat 35, Hi-Mod LV epoxy resin adhesive into vee notched crack.
2. Continue placement until cracks are completely filled.

Note: Prior to filling, seal underside of slab if cracks reflect through.



DETAIL

SCALE: 1½" = 1'-0"

PAY ITEM (1)

PREPARE, PRIME, AND PAINT STEEL BEAMS AND COLUMNS

DESCRIPTION:

LOCATIONS AND QUANTITIES OF STEEL SURFACE TO RECEIVE NEW PAINT WILL BE DETERMINED BY THE ENGINEER/OWNER. PREPARE THE STEEL SURFACE FIRST WITH A PRESSURE WASH USING MIN. 2,500 PSI. PRESSURE GUN, THEN TO SP3 LEVELS WITH NEEDLE GUN AND GRINDER. PRIME AND PAINT PREPARED SURFACE TO SPECIFIED FILM THICKNESS, IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

WHEN A PARTIAL SECTION OF A STEEL BEAM/COL. IS SELECTED TO RECEIVE NEW PAINT, MASK-OFF THIS SURFACE AREA USING STRAIGHT LINES BEFORE PROCEEDING TO PREPARE, PRIME, AND PAINT IT IN A NEAT WORKMANSHIP MANNER.

MATERIALS:

PRIMER AND PAINTS:

TNEMEC OMNITHANE 530 PRIMER, 2.0 TO 3.0 MILS PER COAT
TNEMEC 135, MID-COAT, 4.0 TO 6.0 MILS PER COAT
TNEMEC 73, TOP COAT, 2.0 TO 5.0 MILS PER COAT

	SK-1
REFERENCE SHEET: -	HIGH/HANOVER PARKING FACILITY PORTSMOUTH, NH
DATE ISSUED: 10-1-2003	FAY, SPOFFORD & THORNDIKE, INC. ENGINEERS · PLANNERS · SCIENTISTS